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New Instruments.

A SIMPLE SUBSTITUTE FOR THE LEITER COIL.

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THE accompanying cut illustrates a rubber bag made for the purpose of applying cold or heat to the mastoid region. A clamp (not shown in the cut) securely closes the neck, making it water-tight. It is applied with the wide part over the mastoid, the clamped end uppermost, and the auricle protruding through the opening. A piece of tape, fastened in the rings above and below and passing under the chin and over the head, where it is tied, holds it in place securely; fastened in this way, it may be worn while the patient is sitting up or in the recumbent posture, and by reversing the clamp it may be worn on either side.

DAVOL RUBBER CO.

This simple apparatus is a good substitute for the Leiter Coil, and is more convenient for many cases in private practice. When filled with cracked ice it will serve its purpose for about an hour, being therefore much more convenient than the cold compresses commonly used, which require changing every two or three minutes, and entail a wetting of the skin, which is liable to excoriate it and add to the discomfort of the patient. It can also be used as a hot-water bag if desired.

NOTE.—The bag is manufactured by the Davol Rubber Company of Providence, R. I., and can be obtained of dealers in surgical appliances at a nominal price, within the reach of a dispensary patient.

Medical Progress.

RECENT PROGRESS IN FOODS, DRUGS AND ARTICLES OF DOMESTIC USE.

BY B. F. DAVENPORT, M.D.

THE CHEMICAL DIFFERENCE IN COMPOSITION BETWEEN COW AND HUMAN MILK, AND THE MEANS FOR CORRECTING THEM.[1]

IN his paper before the Medical Society of Munich, upon a better method of sterilizing milk, Professor Soxhlet has pointed out that although this would remove the more important difference, yet it did not give to cow's milk all the properties which the natural food of the infant possesses. There still remains differences of a chemical nature which should also be removed.

Of those differences the following are the more important: (1) the different manner in which their caseins coagulated; (2) their different proportions of lime-salts; (3) the difference in their absolute amount of nutriment, and in the proportion of the separate ingredients to each other.

[1] By Prof. Dr. F. Soxhlet, Münchener Med. Wochenschrift, January 24, 1893.

The first of the above differences has hitherto been considered of the greatest practical importance, because the less easy digestibility of the cow casein has been ascribed to its manner of coagulation; for cow's milk, when either acid or rennet has been added, produces a firmer curd than does human milk. We, however, now know that its manner of acting with rennet is alone of importance in this regard, and as this is quite a different process for its action with acids, all the conclusions hitherto based upon its action with muriatic acid or with this acid and pepsin are without any real significance as to its use as an infant food.

The difference in the manner of coagulation is not a sufficient ground for inferring a chemical difference in the caseins themselves. The firmness of the curd produced by the rennet of the stomach depends entirely upon the concentration of the casein solution, the amount of soluble lime-salts present, and upon the acidity of the solution.

With cow's milk all three of the above conditions are strongly unfavorable for its manner of coagulating. For cow's milk contains about twice as much casein, six times as much lime, and about three times as great acidity as does human milk. No wonder that with such a composition its coagulum is leathery, while the other is fine and flocculent. By proper dilution with water and neutralization, however, can cow's milk be so altered as to coagulate very much like human milk; yet it cannot be made to act exactly like it, because that the amount of lime-salts present cannot be lessened. The dilution with water has long been used as a practical means of lessening their differences. The addition of alkalies to reduce the acidity to that of human milk has been a second practical method. But a cow's milk so neutralized cannot be sterilized without suffering a marked alteration, for the milk-sugar being acted upon, the milk becomes brown and acquires a burnt flavor. Human milk would undergo a like change if sterilized, even without any addition. In neutralizing the cow's milk, therefore, it must be done after the sterilization, and best just before using by adding to each 100 grammes (or about three fluid ounces) 0.1 gramme (1.5 grains) of bicarbonate of soda, which may be in the form of a lozenge such as is prepared by apothecaries. This correction of the acidity is useful whenever a particularly firm curd is formed or the stomach secretes a larger amount of acid or of lime-salt than usual; otherwise every complication or opportunity for a renewed infection of the milk had better be avoided.

The more the milk is diluted with water the more flocculent becomes the curd which is formed. But this addition is limited by other conditions which are as important for nutrition as fineness of the curd. By too much dilution the volume of food to be taken becomes either excessive, or the absolute quantity taken too little for a satisfactory growth. An increased consumption of water increases the waste of albumin and of fat, and hinders the growth of the body. Furthermore, the increased excretion of urine disturbs the child and interferes with its well being. The chief disadvantage of too much dilution lies plainly in too little supply of nourishment, as a simple calculation shows. According to the investigation of E. Pfeiffer, a nursling of eight to nine weeks in age consumes daily 900 grms. of breast milk, a bottle-fed child given a like quantity of a mixture of one part cow's milk with three parts of water would receive but 8 grms. of

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